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ABSTRACT

This research review synthesizes the findings of eight studies (1965-1969) of educational research, development, and dissemination (RD&D) training programs. The review has five sections: 1) purposes and components of RD&D training programs; 2) curriculums of programs other than doctoral level, i.e., post-doctoral programs, sub-doctoral graduate programs, undergraduate research training programs, short-term institutes and special training project, and program development grants; 3) institutional settings for RD&D training, including lists of top research and researcher producing institutions; 4) effects of present training programs, and 5) prognosis for effectiveness of future training programs. Section 4 concludes that the curtailment of Elementary and Secondary Education Act (ESEA) Title IV programs will render them ineffective in meeting manpower needs; that the graduate training programs hold the most promise for increasing research manpower but lack the necessary planning for making significant inroads on basic research needs and needs for new D&D roles; that little impact has been felt in changing curriculums or objectives of training programs since most of them replicate or are superimposed on existing training programs; and that graduate awards were made to institutions already in the RD&D training business. Section 5 lists eight specific suggestions for modification of plans for the future. (JS)

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AN ANALYSIS OF FORMAL PROGRAMS FOR THE TRAINING OF EDUCATIONAL RESEARCH DEVELOPMENT, AND DISSEMINATION PERSONNEL*

by

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This "Analysis of Formal Programs for the Training of Educational Research, Development, and Dissemination Personnel" is organized around the following topics: (1) programs and curricula, (2) institutions where RD & D personnel are prepared, (3) a look at effectiveness of present programs, and (4) a prognosis for the effectiveness of programs in the future.

INTRODUCTION

Within the past 18 months, four studies of RD & D training programs have been done. DiLorenzo[1] analyzed the graduate training programs initiated under Title IV of the Elementary and Secondary Education Act of 1965 to ascertain the extent to which those programs were likely to achieve their intended purposes. Sieber[2] assessed the first year operations of Title IV training programs but he, like DiLorenzo, was primarily interested in the graduate programs because, as he noted, "these are the programs that promise to contribute most significantly to the next generation of educational researchers."

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Clark and Hopkins[3] analyzed the Title IV programs to determine their capability of responding to RD & D manpower demands. Under the sponsorship of the Clark and Hopkins study, Roaden[4] attempted to elicit a description of RD & D training programs that are in operation throughout the country. In August, 1967, program descriptions were asked for by a letter sent to 340 professors of educational research (a mailing list compiled by the Phi Delta Kappa Research Services Division) and all Title IV program directors.

In addition to the above studies, earlier reports by Bargar[5] and his associates, Buswell[6] and his associates, Sieber,[7] and Krathwohl provide a framework and base of data for extending our knowledge about RD & D training programs.[9] Also data collected by Worthen and Roaden for a study of the research assistantship have been utilized in the preparation of this report. (That study is now in progress.)

THE POTENTIAL FOR GROWTH IN RD & D TRAINING

The potential for increasing the number of RD & D training programs and increasing the products of those programs logically would improve as the number of university graduate programs, especially doctoral programs, expand. The number of universities awarding doctorates in education in 1967 was 113,[10] a modest increase over the 99 universities that awarded doctorates in 1964 (a 14 per cent increase), and the 80 that awarded doctorates in 1954[11] (a 41 per cent increase). The increase in doctoral graduates has not been so modest, however. Three thousand four hundred twenty-six (3426) doctorates were awarded by the 113 universities in 1967;[12] 2,432 doctorates were awarded by the 99 universities

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in 1964; (a 41 per cent increase); and 1,495 doctorates were awarded in 1954 (a 129 per cent increase). Thus, doctoral graduates were increasing at a rate three times greater than the number of institutions that awarded doctorates during the years specified--a fact that is relevant to subsequent discussions of institutional settings for RD & D training.

Please remember that growth of institutions is only a measure of potential for growth in trained RD & D personnel. A more intensive analysis of program objectives, curricula and related program components is necessary to ascertain the facts of RD & D training.

THE PURPOSES AND COMPONENTS OF RD & D TRAINING PROGRAMS

The August, 1967, invitation to Title IV directors and 340 professors of research to describe their programs included the following specific questions: (1) What program content is considered unique? (2) What curriculum materials are used that are not normally available through commercial publishers? (3) What is the nature of apprenticeship experiences required of trainees? and 15 (4) To what extent are persons being prepared to fill newly emerging roles?

The obvious purpose was to go beyond features of traditional programs, regardless of the merits and qualities of the traditional programs to search out new conceptualizations of programs, new content, and responsiveness to demands for manpower in new and emerging RD & D roles.

Others have described some aspects of research training programs. These descriptions generally have dealt only with methodological content. For example, Sieber, in 1966, noted that doctoral producing universities offer an average of

9.5 courses in research which generally are scattered throughout a large number of departments, with concentrations in established divisions for training researchers in only twenty-seven per cent of the schools. "Basic research methods and design," a course most frequently offered by the schools, is offered by 96 per cent of the schools, and 4.6 such courses are offered per school; next is "statistics" offered by 85 per cent of the schools, and 3.0 courses per school; "testing and measurement" is offered by 71 per cent of the schools, with 2.0 courses per school; courses reflecting "needed research" are offered in 22 per cent of the schools, with 2.2 courses per school; "school surveys" (which contribute to research) is offered by 16 per cent of the schools, with 1.5 courses per school; and all other research courses were offered by only 14 per cent of the schools, with 2.7 courses per school.[16]

Krathwohl's 1965 survey of doctoral producing universities revealed 91 per cent of the institutions offered an introductory course in research, a greater percentage offered statistics; 46 per cent offered an experimental design course; and courses in measurement and evaluation were frequent. However, the full sequence of courses--research methods, statistics, design, and measurement--as a requirement in doctoral programs was quite rare, indeed.[17]

The search for new or different programs resulted in receipt of program descriptions, adequate for analysis, from 47 institutions. These institutions described 57 programs (2 post-doctoral, 31 doctoral, 5 masters, 6 undergraduate, and 13 short-term institutes). In spite of our efforts to go to professors and seek descriptions of programs that may not be institutionalized, the vast majority of respondents described federally sponsored (usually Title IV) programs. Two logical explanations are: (1) the Title IV programs are the most innovative ones

at the universities, or (2) the programs not federally financed have not been clearly defined by the universities, and the time and efforts required to describe the programs were too demanding. Probably both explanations are the case. To the extent that the latter explanation applies, the evidence indicates that there may still be some problems which were contained in Clark's 1963 observation "that educational research, at this point in its historical development, was clearly inhabiting the periphery of the profession."[18] Sieber, likewise found that of his sample of 64 graduate schools of education; 25 indicated that they neither emphasized research training nor provided a program for training researchers in education. Further, he noted:

> Only 3 per cent of the schools have a program other than the regular degree program and <u>also</u> emphasize research training. Another 14 per cent, however, emphasize research training, and provide for it trhough the regular degree program; which yields <u>17 per cent which both emphasize research training and provide some form of program for students who want to make a research a career.</u>[19]

Apart from the fact that the 1967 study resulted in receipt of mostly Title IV program descriptions, other analysts of research training have produced data that warrant the conclusion that not only are the Title IV doctoral level programs the most innovative, they, for the most part, <u>are</u> the regular, on-going doctoral programs in the universities.

DiLorenzo concluded after visiting nine of the institutions which purportedly had innovative programs that these nine were "operationally the ongoing doctoral programs of the sponsoring universities. Many of the trainees had been doctoral students prior to the initiation of the training programs; they are now pursuing previously chosen courses of study with the support of federal grants."[20]

In his review of the 85 training proposals approved for 1966-67, DiLorenzo notes the "infrequency of new courses or innovative training plans geared to the ultimate goal of applying research techniques in the solution of school problems. The dissemination and development roles of the educational researcher were, for the most part, completely overlooked in the program plans."[21]

Sieber, in his analysis of Title IV doctoral programs, observed that "the doctoral recipients from the USOE training programs will reproduce the distribution of research fields in schools of education found 10 years earlier."[22] Sieber is concerned about the virtual absence of trainees from the social and behavioral sciences, and DiLorenzo's concern is the virtual absence of programs devoted to training for researchers to attack school based problems. While they each were looking to the Title IV programs for the achievement of vastly different objectives, they found the programs somewhere in the middle, where the old research training programs already were located.

Clark and Hopkins categorized 718 doctoral and sub-doctoral trainees by "occupational goals of the trainees" and they reported the following destribution:

1. Basic researcher	42 trainees (5.8 per cent of total)
2. Research specialist for public schools	173 trainees (24.1 per cent of total)
3. Research specialist in subject area	87 trainees (12.1 per cent of total)
4. Researcher in specialized area of education	89 trainees (12.4 per cent of total)

5. General educational research training	263 trainees (36.6 per cent of total)	
6. Institutional research in higher education	4 trainees (0.6 per cent of total)	
7. Newer D & D roles	48 trainees (6.7 per cent of total)	
8. Miscellaneous	12 trainees (1.7 per cent of total)	23

Curricula of Doctoral Level Programs

Returns from the August, 1967, survey of training programs were analyzed to determine curricula components. Thirty-one doctoral level programs were submitted by 29 universities. These 31 programs covered 58 substantive fields of specialization (e.g. adult education, guidance, reading, etc.) and 12 programs with specialization in research methodology. (These latter programs were intended to prepare persons to extend the base of knowledge in the research process). Altogether 70 specializations were reported, and only 9 were reported more than once. Certainly those findings, coupled with limited manpower, do not forecast a potential for dramatic advances in any single specialized field.

All programs reflected content in research methods. Course descriptions, when provided, were frequently inadequate, and comparability of courses judged by course titles could not be established across programs with any sense of accuracy. One generalization is clear, however; this component of the curriculum seemed little different from programs of yesteryear.

Most program directors called attention to the importance of apprenticeships, practica, and other non-course components of programs. These experiences were

commonplace, but rarely was academic credits given for the experiences. It seems inconsistent to withhold credits for the experiences that are deemed to be of such vital importance. It may be that non-credit research experiences and credit courses compete for the time of doctoral students and whatever creative possibilities there may be within the apprenticeships , they hampered by the need to fulfill course requirements.

The usual locus of research experience (by better than 2:1) was the university department or another university agency (29). Seven programs mentioned public schools as the usual locus for the research experience; one mentioned a state department of education; and four cited an educational laboratory or other research agency. These programs did not seem to be geared to meeting the demand for personnel to work in non-university settings.

Curricula of Programs Other Than Doctoral Level

RD & D training programs at levels other than the doctorate offer potential for breaking away from academic traditions. The components of those programs are delineated in this section of the paper.

1. Post-doctoral Programs

Title IV post-doctoral programs began as institutional programs but shifted to individual awards. To date some 70 participants have been or are currently in a training program. Awards are now made to persons who are already producing researchers, with the focus on sharpening skills and improving research quality. Thus, these programs will do nothing in a direct way to expand quantitatively RD & D manpower. The content of programs is geared to

research exclusively, rather than development and dissemination.

2. The Sub-doctoral Graduate Programs

About 25 per cent of the trainees in the 1967 Title IV graduate programs were at the sub-doctoral level; most of them were pursuing master's degrees. The programs, of 1 to 2 years duration, most generally have as their stated purposes the training of research specialists for public schools. By and large these programs consist of a core sequence of courses in a substantive field, a series of courses in quantitative methods and some type of practica or research experiences.

The capabilities of master's degree programs, modeled after the M.A.T. degree structure, for training in new roles, appear to hold real possibilities; yet they for the most part have classical designs and classical content.

3. The Undergraduate Research Training Program

The Title IV undergraduate programs are now defunct. Those that were funded (17 during the first year of Title IV programs) provided quantitative content supplementary to teacher training content. Very likely the products were heading for teaching roles or were recruited into graduate programs. The phase-out of funded undergraduate programs seems inconsistent with available knowledge of career patterns. Most disciplines that prepare large numbers of research personnel begin training in undergraduate programs; whereas undergraduate colleges of education have a single purpose,

that of preparing persons for the professional practice of teaching. Thus, the manpower pool for recruiting researchers is from those with defined career goals and usually a few years of teaching experience. Furthermore, they frequently hold master's degrees and experience in some other specialized practice role. The difficulties of retraining for RD & D roles after career patterns are established are complex and for the most part only minimally successful. Brown found that only 12 per cent of the 1964 doctoral graduates decided to do the doctorate during the undergraduate program. The positive reason most frequently given by the 1964 doctoral graduates for entering the program was "opportunity for greater self-fulfillment; (no doubt their benchmark is the practice world with which they are familiar) and the least acceptable positive motivation was "a certain fascination with the world of research and experiment."[24]

4. Short-term Institutes and Special Training Projects

The short-term institutes and special training projects have enjoyed sustained support from USOE with only a slight decline in support and trainees. Of the 35 training programs in 1966-67, 25 prepared trainees for research, 8 for development, and 2 for dissemination. Twenty-three of the awards were made to train personnel for subsequent service in public school settings. The one activity not designed for school systems is the AERA pre-session training program designed to foster qualitative improvement in the educational research community.[25]

Overall, these institute programs showed great promise for preparing persons to fill newer D & D roles, but only 10 projects paid explicit attention to those roles. Clark and Hopkins further noted that 20 of the 27 institutions conducting special projects or institutes were not among the "research center," prestigious universities.[26]

5. Program Development Grants

Program development grants have been so miniscule as to have little qualitative or quantitative influence on RD & D training. The median of the twenty-eight first-year grants was barely large enough to support one additional faculty member. About two-thirds of the grants went to prestige "research center" institutions. Twenty-four of the twenty-eight programs were related to strengthening research training; one for development, and 3 for dissemination.[27] Plans for subsequent programs, however, apparently do include support for development of training materials.

INSTITUTIONAL SETTINGS FOR RD & D TRAINING

A number of researchers have derived listings of the top research and researcher producing institutions. The identification of institutions where research and researcher preparation is taking place is important for students of the research process and students of research as a relevant human, institutional, and social endeavor. A knowledge of the institutions that are producing research and researchers, and a knowledge of institutions that are not producing research or researchers, but have specified objectives toward that end, can provide a base of information for conducting case analyses or other forms of institutional studies that could give important insights for improving productivity. Such information should be useful for those institutions that either are planning research training programs or those institutions that have been unsuccessful in achieving their objectives of research and researcher productivity.

Bargar and his associates listed thirty institutions most often identified as having granted the highest degree to the persons identified for inclusion in the Register of Research Personnel.[28] Buswell and his associates listed twenty-seven institutions that had awarded doctoral degrees to his population of 93 highly productive researchers.[29] Seiber listed twenty-two universities which were nominated by Deans and research coordinators of schools of education as the institutions doing the "best research".[30] Worthen and Roaden collapsed those lists of universities into one list, noting the rank of each university in the prior

listing, and the number of lists in which each university appeared. The top twenty in that list of 40 were:

1. Columbia University
2. University of Chicago
3. University of Minnesota
4. Harvard University
5. University of Michigan
6. Ohio State University
7. Stanford University
8. University of Wisconsin
9. University of Illinois
10. University of California at Berkeley
11. University of Iowa
12. New York University
13. University of So. California
14. Boston University
15. Syracuse University
16. UCLA
17. University of Texas
18. Indiana University
19. Cornell University
20. Michigan State University

Possible hazards of deriving and using such lists should be noted. The most serious hazard is the probability of assuming that a listing of top producing universities is also a listing of high-producers of research and researchers. There are no data to warrant such a conclusion; rather, these universities are the highest producers that were identified within a field of low productivity.[32] A second deficiency of the list is the varied set of criteria which were used in establishing the lists which were collapsed.

Clark and Hopkins applied one or more criteria for designating institutions as "Productive Educational Research Centers". Their criteria were: (1) they were the schools of education involved traditionally in research production or the production of researchers; (2) they were the site of a USOE R & D Center; (3) they were the recipients in FY 1967 of Substantial USOE research support monies

(250,000+) other than funds for the support of research training.[33] Their analysis of the Title IV graduate training programs revealed that among the 53 institutions sponsoring these programs:

Twelve were in the top 15 institutions identified by Bargar, Buswell, and Sieber.

Eight of the nine institutions housing USOE R & D Centers were represented.

Eleven of the participating institutions which fell in neither of the foregoing categories were centers of research production for USOE, receiving $250,000 or more in FY '67 in research support other than for the training program itself.[34]

Sieber likewise noted that "56 percent of the institutions with special (i. e., research training) programs in 1964-65 now have USOE programs,... and only 32 percent of those where no programs existed have such programs today.[35]

In an effort to take another look at productivity of institutions using a fresh set of data, a sample was drawn consisting of 150 of the highest producers of research[36] which had been identified in the Worthen and Roaden study of research assistantship experiences.[37] Reference documents were examined in an attempt to identify (1) what institutions awarded the highest degree held by these productive researchers, and (2) what institutions were their current employers. The degree granting institution was identified for 87 of the sample, and the current employing institution was identified for 118. Of most interest is

the total range of institutions that awarded degrees to the top researchers. Altogether there were 46 institutions which awarded degrees to the sample of 87 top producers. Twenty-six had produced only one researcher, 20 had produced two or more, and only seven produced three or more. Those that produced two or more are listed in rank order as follows:

1.	Columbia University	8	11.	Purdue University	2
2.	University of Minnesota	7	12.	Colorado State University	2
3.	Ohio State University	5	13.	Michigan State University	2
4	University of Illinois	4	14.	St. Louis University	2
5.	University of Michigan	4	15.	Northwestern University	2
6.	University of So. Calif.	4	16.	UCLA	2
7.	Harvard University	3	17.	University of California - Berkeley	2
8.	New York University	2	18.	University of Iowa	2
9.	Indiana University	2	19.	Stanford University	2
10.	University of Nebraska	2	20.	Penn State University	2

A comparison was made of universities that awarded the highest degree to our sample of researchers, with a listing of institutions that awarded the most doctorates in education. Ranked according to the most doctoral degrees awarded in the field of education in 1967, the twenty-two universities that awarded fifty or more doctoral degrees are:[38]

1.	Teacher's College - Columbia University	220	12.	University of Nebraska	73
2.	New York University	150	13.	University of Oregon	70
3.	Indiana University	117	14.	Stanford University	70
4.	The Ohio State University	112	15.	University of Texas	69
5.	Michigan State University	103	16.	Florida State University	67
6.	University of So. Calif.	87	17.	University of Michigan	61
7.	University of Illinois	83	18.	University of Iowa	60
8.	University of Toledo	83	19.	University of Minnesota	59
9.	University of Wisconsin	82	20.	University of Georgia	56
10.	Colcrado State University	76	21.	Oklahoma State University	56
11.	University of California - Berkley	73	22.	Penn State University	53

You will note the similarity between this list and the list of institutions that awarded degrees to the most productive researchers. The rank order correlation of the two lists is significant at the .001 level. Not all of the researchers were likely to have been products of education doctoral programs. But a reanalysis of our total data deck indicate two-thirds were from education.

Employers of the top producers of research were Texas, with six; Wisconsin, Chicage, Berkeley, and Georgia had four each; and Ohio State, Michigan State, and Illinois had three each. A rank order correlation of these institutions that are employers of the researchers with the institutions that awarded the most doctorates in education was also significant (at the .01 level).

One is forced to conclude that most any university can turn out one or two productive researchers over the course of several years. This happy accident has a greater probability of occurring in institutions that produce the most graduates.

EFFECTIVENESS OF PRESENT TRAINING PROGRAMS

The effectiveness question has been dealt with to some extent throughout the paper, however, a summarization is in order.

The curtailment of funds for ESEA Title IV programs will render them ineffective in meeting manpower needs. The graduate training programs hold the most promise for increasing research manpower, but they lack the necessary planning for making significant inroads on basic research needs or needs for new D & D roles.

Little impact has been felt in changing curricula or objectives of training

programs since most of them replicate or are superimposed on existing training programs; and graduate awards were made to institutions already in the RD & D training business.

A PROGNOSIS FOR EFFECTIVENESS OF FUTURE TRA INING PROGRAMS

A look at current formal train ing programs for RD & D personnel provides a "state of the art" perspective, and should give clues for modifications in the future. Plans for the future might well be shifted as follows:

1. USOE developmental and training grants might well be targeted to a few schools for strenthening programs of preparation for basic educational research; a few programs of preparation for research in the research process (including evaluation processes); and a few programs that will zero in on preparation for each of a number of new D & D roles. Because of the wide range of these new roles and virtually no expertise in training for them, a significant proportion of support may well be concentrated here. What is called for is targeted program development so that exemplars can be established for the educational research profession. (Indications of plans for allocating developmental funds for training materials development is a good omen.)
2. With a sparcity of institutional leadership available, the further establishment of new RD & D institutions might be curtailed with

a focus on strengthening and reconceptualizing objectives and programs within the existing institutions.

3. Agencies that are focusing on new D & D roles have little alternative but to train their own personnel; yet they lack training personnel and expertise. Universities also lack expertise in new roles, but they are committed to training. There must, for the benefit of each institution and of the profession, be joint training endeavors. A program that provided an excellent model was one for "Graduate Research Training in the Problems of Educating the Orthopedically Handicapped". That program required active participation of specialists in three institutions: University of Southern California, The Rancho Los Amigos Hospital, and the Downey Unified School District--a private university, a county hospital, and a public school system. Staffing new programs in the absence of such training programs is discouraging, almost futile. Clark and Hopkins conducted a survey of a sample of ESEA Title III centers in school systems (eliminating supplementary centers) to see where personnel for filling new RD & D positions were coming from, since they clearly were not being prepared in formal training programs.[39] For the most part, they found these programs were staffed by professionals already available to the school district; at the time these employees moved to the Title III centers they were employed by the

district as school administrators, teachers, or special service personnel (e.g. counselors, school psychologists, etc.). In summary, titles of new roles seemed to reflect the presence neither of "new wine" nor "new bottles".

4. Within universities, colleges of education have followed the same traditions as other professional colleges; that is, they have relied on other disciplines to advance new knowledge and to produce research and researchers.

   The result has been a focus on professional practice by the colleges virtually apart from research. The research departments (mainly psychology) have been trying to establish their own identies, and their methodologies have been too reliant on the natural sciences.

5. Undergraduate colleges of education have had single-minded purposes, that of training teachers. Diversification of undergraduate training to provide initial preparation for RD & D is long overdue. Had USOE grants for undergraduate programs not been eliminated, they could have stimulated these needed changes in RD & D career development.

6. University-client partnership patterns are slowly emerging. These patterns hold promise for more sharply focused training programs for professional practice as well as accelerating essential mission-oriented research. On this latter point of developing mission-oriented research, we can learn a lesson from the Department of Defense,

"Operation Hindsight" project which concluded that 95 percent of all events contributing to the development of weaponry systems came from mission-oriented research rather than basic, non-mission-oriented research.[40]

7. A positive omen for the future is the finding by Sieber that doctoral graduates of Title IV programs will, on the average, be 7.5 years younger at graduation than were the 1964 doctoral graduates. The data relating age at the time of receipt of doctorate to research productivity has been clearly established, with the younger graduates more likely to be productive.[41]

8. Another positive sign for the future comes from an analysis of the Worthen-Roaden data which revealed that the members of the sample who recently graduated from training programs are more productive than those of former years. (Level of annual productivity for those whose highest degree was received after 1964, was significantly greater (.001 level) than those whose highest degree was received before 1960.)

There is little cause for shouting! But, let's not despair; careful planning for the future can make a dramatic difference in quantity and quality of RD & D training.

FOOTNOTES

1. Louis T. DiLorenzo, "Appraisal of ESEA Title IV Graduate Research Training Programs," Special Project memorandum, June 15, 1967.

2. Sam D. Sieber, Analysis of USOE Research Training Programs, Bureau of Applied Social Research, Columbia University, New York, New York, January, 1968, p. 10.

3. David L. Clark and John E. Hopkins, A Study of Roles for Researchers in Education, Bloomington, Indiana; School of Education, Indiana University, 1969.

4. Arliss L. Roaden, "An Analysis of Research Training Programs," in Clark and Hopkins, op. cit.

5. Robert Bargar, Egon Guba, and Corahann Okorodudu, Development of a National Register of Educational Researchers, The Ohio State University, CRP No. E-014, 1965.

6. Guy T. Buswell, et. al., Training for Educational Research, CRO 51074, Center for the Study of Higher Education, University of California, Berkeley, 1966.

7. Sam D. Sieber, The Organization of Educational Research, CRP 1974, Bureau of Applied Social Research, Columbia University, 1966.

8. David R. Krathwohl, "Current Formal Patterns of Educating Empirically Oriented Researchers and Methodologists," in The Training and Nuturing of Educational Researchers, edited by Egon Guba and Stanley Elam, Phi Delta Kappa Incorporated, 1965.

9. Blaine R. Worthen and Arliss L. Roaden, The Impact of Research Assistantship Experience, Phase I, The Ohio State University, Evaluation Center, Columbus, Ohio, 1968.

10. American Association of Colleges for Teacher Education, Teacher Productivity-1967, AACTE, Washington, D.C., 1968.

11. Guy T. Buswell, et. al., op. cit., p. 7.

12. American Association of Colleges for Teacher Education, op. cit.

13. Guy T. Buswell, et. al., op. cit., pp. 7 and 40.

14. Ibid., p. 7.

15. Arliss L. Roaden, op. cit., p. 1.

16. Sam D. Sieber, The Organization of Educational Research, pp. 292-293.

17. David R. Krathwohl, op. cit.

18. David L. Clark, "Educational Research: A National Perspective," in Jack A. Culbertson and Stephen P. Hencley, Educational Research: New Perspectives, The Interstate Printers and Publishers, Inc., Danville, Illinois, 1963, pp. 33-42.

19. Sam D. Sieber, The Organization of Educational Research, op. cit. pp. 257-258 (underlining appears in original).

20. Louis T. DiLorenzo, op. cit., pp. 10-11.

21. Ibid., pp. 7-8.

22. Sam D. Sieber, Analysis of USOE Research Training Programs, p. 14.

23. David L. Clark and John E. Hopkins, op. cit., pp. 319-320. (Data derived from tables).

24. Lawrence D. Brown, Doctoral Graduates in Education: An Inquiry Into their Motives, Aspirations and Perceptions of the Program, Indiana University Foundation, Bloomington, Indiana, 1966, pp. 79-80.

25. David L. Clark and John E. Hopkins, op. cit., pp. 327-334.

26. Loc. cit.

27. Ibid., pp. 311-315.

28. Robert Bargar, Egon Guba, and Corahann Okorodudu, op. cit.

29. Guy T. Buswell, et. al., op. cit.

30. Sam D. Sieber, The Organization of Educational Research, op. cit.

31. Blaine R. Worthen and Arliss L. Roaden, op. cit., p. 104.

32. For example, Buswell and his associates found that only 25 per cent of their sample of 1954 doctoral graduates had published a single research report during the 10 year period following receipt of the doctorate; and only half of those had produced more than one such report. Buswell, et. al., op. cit., p. 9.

33. David L. Clark and John E. Hopkins, op. cit., p. 311.

34. Ibid., pp. 320-321.

35. Sam D. Sieber, Analysis of USOE Research Training Programs, op. cit., p. 17.

36. The sample of 150 was drawn as follows: the 50 top producers of research who held a genuine research assistantship during their preparation program; the 50 top producers who have held an assistantship which did involve the conduct of research (ersatz); and the 50 top producers who had held no assistantship. Such a sample should not favor any particular set of institutions.

37. Blaine R. Worthen and Arliss L. Roaden, op. cit.

38. American Association of Colleges for Teacher Education, op. cit.

39. David L. Clark and John E. Hopkins, op. cit., pp. 335-347.

40. D. S. Greenberg, "Hindsight: DOD Study Examines Return on Investment and Research," Science, Vol. 154, 18, Nov., 1966, pp. 872-873.

41. Sam D. Sieber, Analysis of USOE Research Training Programs, op. cit., pp. 76-78.

42. Blaine R. Worthen and Arliss L. Roaden, op. cit.